TRUCKS FOR SKATEBOARDS

FIELD OF THE INVENTION

This invention relates primarily, but not exclusively, to trucks for skateboards, although as used herein, the term "truck" relates to steering devices for means of transport other than skateboards. For example, roller-skates, or other devices that use a two-bogey, four-wheel, "lean to steer" method of changing direction.

ADVANTAGES OVER THE PRIOR ART

The invention provides a truck for a skateboard which enables a substantial degree of positive steering and requires less material to manufacture than a conventional truck so as to enable a skateboarder to improve his performance.

SUMMARY OF THE INVENTION

According to the invention, a truck for a skateboard comprises a base structure for attachment to the skateboard deck, a yoke assembly having spaced-apart portions flexibly located by the base structure, and a king-pin assembly including a king-pin for clamping the base structure and the yoke assembly together, so that with a pair of skateboard wheels carried by the truck, the arrangement is such that the rotational axis of the wheels is disposed substantially at right angles to the longitudinal axis of the king-pin and said rotational axis of the wheels is also disposed at a steering head angle of between 45° and 20° to the vertical when the skateboard is at rest, on the ground, and remains spaced from, and substantially parallel to the plane containing the radical arc of the wheel axis as it rotates about the steering head angle, said plane being substantially perpendicular to the steering head angle.

The steering head angle is preferably at substantially 30° to the vertical.

The king-pin assembly is preferably disposed between the spaced-apart portions flexibly located by the base structure.

BRIEF DESCRIPTION OF THE DRAWINGS

An embodiment of the invention will now be described by way of example only, with reference to the accompanying drawings, wherein:-

Figure 1 is a side view in medial section of a truck for a skateboard,

Figure 2 is an inverted view of the base structure thereof,

Figure 3 is an end view in the direction of arrow A of Figure 2,

Figure 4 is an end view of the yoke assembly,

Figure 5 is a side view of the yoke assembly,

Figures 6, 7 and 8 and Figures 9, 10 and 11 illustrate details of bushes that may be employed by the yoke assembly, and Figures 12 to 14 illustrate further details of the various axes etc.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

With particular reference to Figure 1, a truck 1 for a skateboard 2 comprises a base structure 3 detachably secured to the underside 30 of the skateboard deck 4, a yoke assembly 17 having spaced-apart (upper and lower) portions 17a, 17b flexibly located by the base structure 3, and a king-pin assembly 5 including a king-pin 7 for clamping the base structure 3 and the yoke assembly 17 together.

The arrangement is such that with a pair of skateboard wheels 6 carried by the truck 1, the rotational axis 8 of the wheels 6 is disposed substantially at right angles to the longitudinal axis 9 of the king-pin 7 and said axis rotational 8 is also disposed at a steering head angle α of substantially 30° to the vertical, (represented by vertical line 10), when the skateboard is at rest on the ground, i.e. in the position shown. The steering head axis is represented by line 31.

The longitudinal axis 9 of the king-pin 7 extends between the flexibly-located upper and lower portions 17a, 17b. This placement of the king-pin 7 assists control of the skateboard 2.

The base structure 3 has a flanged portion 14 defining a flat surface 15. The portion 14 is releasably clamped to the underside of the skateboard deck 4 by four nut and bolt assemblies, (not shown), located by drilled holes 16 (Figure 2).

Ground level is indicated by reference numeral 24.

The yoke assembly 17 carries the king-pin assembly 5, the king-pin 7 of which is located by axially-spaced bushes 18, 18a of resilient plastics material, such as polyurethane. The bushes 18, 18a are separated by an inwardly disposed flange portion 33 of the yoke assembly 17. The king-pin 7 has a button shaped head 7a and is releasably secured in place by a locknut 19. The base structure 20 has a lower, spherical end 20a which is received by a cooperating bearing 21 of resilient polyurethane located by a concave hollow 34 formed in the lower yoke portion 17b.

The axis 8 of the wheels 6 is defined by a pair of hollow stub axles 22 (Figure 4) upon which the wheels are mounted. The stub axles 22, which are of steel, are located by the lower end 17b of the yoke portion 17, and are disposed well below the king-pin assembly 5. The arrangement reduces weight.

The upper end 17a of the yoke portion 17 is of part spherical form and is located by a cooperating bearing 23 of resilient polyurethane. The bearing 23 comprises a plug secured in the base structure 3.

The skateboard 2 is conveniently provided with two trucks 1 mounted on the skateboard deck 4 in tandem. Each truck is a mirror image of the other. As the skateboard deck 4 is tilted towards the intended change in direction, the yoke assemblies 17 rotate about their steering head axis 31. Tilting the skateboard deck 4 to the left for example, causes the front and rear outer wheels 6 to move apart, and the front and rear inner wheels 6 to move together, resulting in the intended change of direction.

When pressure is released from the skateboard deck 4, the yoke portions 17 are returned to their central positions by resilience in the bushes 18, and 18a. The steering head angle of each truck 1 remains substantially constant during manoeuvres.

The material of both the base structure 3 and yoke assembly 17 of each truck 1 is preferably of T6 spec aluminium alloy or titanium. The king-pin 7, which preferably is of high tensile steel, acts as a locking device to prevent the yoke portion 17 separating from the base structure 20. The yoke portion 17 is disposed between the bushes 18, 18a so that a substantially uniform compression force, (adjustable, depending on the skateboard rider's weight), is imparted. This compressive force keeps the yoke portion 17 in a substantially central position. The bushes 18, 18a also assist in locking (clamping) the yoke portion 17 to the base structure 20 bearings.

The bushes 18, 18a can be changed to suit requirements. For example, salom, downhill speed racing or bowl riding.

The yoke portion 17 supports the associated wheel stub axles 22 which in turn supports the wheels 6 and their bearings. As steering inputs are made, the yoke portion 17 pivots about the base plate 20 and a change in direction occurs. The width of the yoke portion 17 can be changed to suit requirements.

To reduce weight, up to an inner one third of stub axle material could be removed.

The upper and lower bearings 23, 21 serve as shock absorbers and ensure a good fit between the yoke portion 17 and base structure 20.

Figures 12 to 14 illustrate further details of the truck 1. Figure 12 is similar to Figure 1 but turned through 180°, and shows the steering head axis 31 and the radial motion 100 of the rotational axis 8 of the wheels 6.

Figure 13 is a diagrammatic view, looking in the direction of arrow "A" of Figure 12, and shows the radial arc 101 scribed by the rotational axis 8 of the wheels 6. The static

position of the axles 22 is shown at 22a. Angle α is the total radical displacement of the wheel axles 22.

The angle of steer is indicated by reference numeral 102.

Figure 14 shows the base structure 3, axles 22, radial arc 101, steering head axis 31, steering head angle α, axle radial displacement θ, and king pin axis 9. Truck forward motion is indicated by arrow 103.

The rotational axis 8 of the wheels 6 remains spaced from, and substantially parallel to the plane containing the radial arc 101 of the wheel axis 8 as it rotates about the steering head angle α, said plane being substantially perpendicular to the steering head angle α.

In the modified yoke assembly illustrated by Figure 5, the bearing 21 is held in place by a plug 34 secured in the lower portion 17b of the yoke assembly 17. Figures 6, 7 and 8 illustrate alternative upper bushes 18. The bush 18 of Figure 8 has a frusto-conical profile.

Figures 9, 10 and 11 similarly illustrate alternative lower bushes 18a. The bush 18a of Figure 9 has a chamfered edge.

The shapes of the bushes 18a aid assembly and disassembly of a truck 1, as they then avoid interference with adjacent parts of the truck.

As mentioned above, the steering head angle α may be between 45° and 20° to the vertical. However, an angle of substantially 30° to the vertical is preferred.

It will be appreciated that a truck according to the invention has application other than to a truck for a skateboard. For example, roller-skates or other devices that use a two-bogey, four wheel, lean to "steer" method of changing direction.